

DEPARTMENT OF ENERGY

POSITION PAPER

FOR

MARSHALL ISLAND STUDY

FROM

BROOKHAVEN NATIONAL LABORATORY

DECEMBER 1, 1978

5052214

REPOSITORY

COLLECTION

BOX No

FOLDER

DOE/PASO

DOE/NV

1236

BNL FOLDER #3

FY 1979

MEDICAL PROGRAM

## INTRODUCTION AND STATEMENT OF PROBLEMS

On October 3, 1978, a meeting was held at the Department of Energy (DOE) Headquarters in Germantown, Maryland, to discuss a number of problems related to the DOE position in relation to several different programs in the Marshall Islands.

The Medical Program, under the auspices of Brookhaven National Laboratory (BNL), generated a great deal of discussion, concerned primarily with the following problems:

1. The research mandate of BNL for the study and care of radiation related diseases in the exposed populations is clear. However, over a period of twenty-five years, that mandate has been expanded to include care for non-radiation related diseases. This evolution has been necessitated by the virtual absence of adequate primary care in the Marshall Islands. The BNL medical team has responded in a humanitarian manner to diagnose, treat and follow-up a number of pathologic conditions which, if untreated, would have led to increased morbidity and mortality in the exposed and control groups.

A. Basically, the BNL Medical Program is a medical research program. Its original goal was to "screen" for and detect the earliest changes suggestive of radiation-related pathology, and to treat those lesions as indicated. (The World Health Organization (WHO) states the primary responsibility of any screening effort is the ability to resolve all "abnormal" findings and to assure the patient of referral to an adequate primary care center.)

RELEVANT?

B. The difficulties are compounded by the fact that valid pre-exposure health care statistics are difficult or impossible to obtain. The Medical Program is in the untenable position of having to deal often with the probability that a specific pathologic condition is or is not related to radiation exposure, since a cause-effect relationship is impossible to establish definitely for any given case.

WHY  
UNTENABLE?  
WHY IS THIS  
DETERMINATION  
ESSENTIAL?

C. The people are intellectually and emotionally unable to deal with the concept of "probability" without an intensive, highly-sophisticated educational program designed not only to transfer the information intellectually regarding the role of radiation in their lives, but to concomittantly incorporate that new understanding into their behavior, i.e., the ability to place radiation in its proper perspective for the present and the future. Such a program has already been initiated by Jan Naidu, Ph.D., BNL, with promising results.

WHO  
SAYS?

2. The Marshall Islands medical "system" under the Trust Territories is underfinanced. The professional staff is undertrained and overloaded. Critical supplies are usually not available.

A. In the absence of a satisfactory primary care referral base, the BNL Medical Program has expanded its mandate to include such things as a "diabetic study" (which has revealed a high incidence of "maturity onset diabetes") but has set up no mechanism for treatment and follow-up of this disease.

CONTRACTOR  
EXPANDS  
OWN  
SCOPE?

B. In addition, at the request of the people, a large number of Marshallese who were not in the exposed or control groups have gone through the screening examination with the detection of a variety of pathologic conditions. An attempt has been made in

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each case to provide immediate treatment if possible, and to refer the patients to the Trust Territories health care system. Unfortunately, little has been done to treat and to follow-up these patients. Consequently, the BNL medical team has become the de facto primary health care provider to an ever expanding group of Marshallese. The rationale of the Marshallese in the BNL program for their claim to the "right for all medical care" is their association of practically all illness with radiation.

BY  
WHAT  
AUTHORITY  
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IS IMPACT  
HAS NOT BEEN  
SOLELY  
RADIATION  
EXPOSURE.

3. The BNL medical team, because of its frequent surveys has, in the eyes of the Marshallese, come to represent the U.S. "presence" in the islands. The BNL Medical Program has, therefore, become the target of many attacks directed towards the United States agencies responsible for other programs in the Marshall Islands. These unwarranted attacks have, on several occasions, seriously compromised the goals of the Medical Program. Two major problems of health care delivery for all of the Marshallese involve: (a) communications, and (b) transportation. To the best of our knowledge, these problems have not been addressed independently as health care problems.

A VERY  
BROAD  
AND  
LARGELY  
INACCURATE  
STATEMENT

#### DISCUSSION

With the slow growth of the medical program and the development of this matrix of compounding variables, Dr. Burr and Dr. Wyzen requested a position paper that would outline for DOE the alternatives for the support of a study of radiation related injuries in the Marshall Islands. These options should include a wide spectrum of alternative programs, keeping in mind the inextricable

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interrelationship between BNL screening and the health of the people of the Marshall Islands. We feel a failure to deal effectively, in some way, with the primary care requirements of the people will lead to further ill-will, failure to comply with the research protocol (e.g., thyroid therapy), and finally, litigation and a call to foreign and national anti-nuclear groups to witness the "mistreatment" of the Marshallese by the U.S. government.

WHERE IS  
THE ACCEPTANCE  
OF A MORAL  
OBLIGATION  
TO CARE FOR  
INJURED  
PEOPLE?

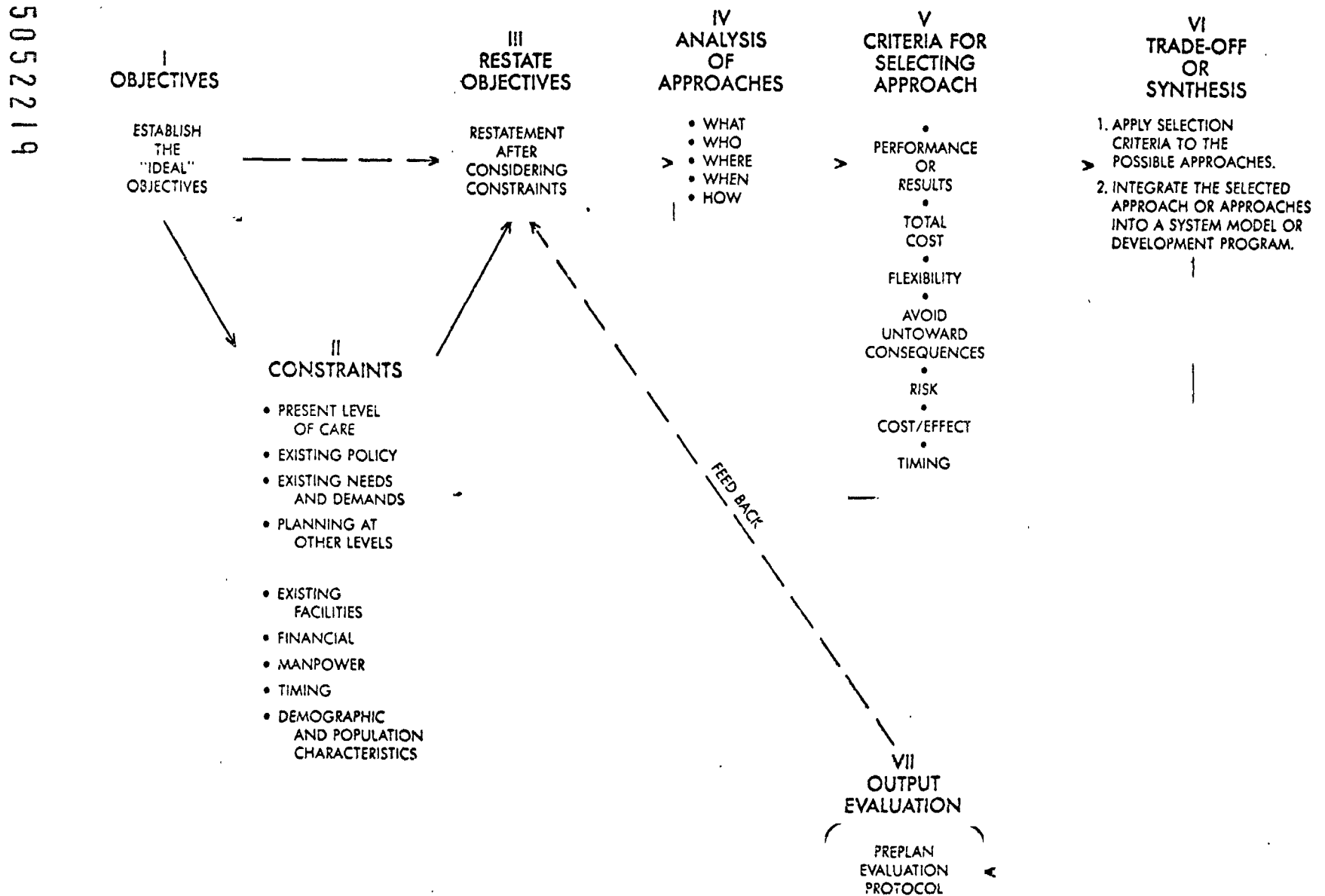
Since primary medical care is clearly not the mandate of the DOE, perhaps some interdepartmental agreement could be reached with the Department of Interior and/or the Department of Defense to answer this very pressing problem. U.S. monies are already going to the Trust Territories to provide health care but the utilization of those funds leaves much to be desired.

The analysis of options open to DOE-BNL has been approached in a system analysis format, utilizing an outline as developed by Gordon A. Friesen, of the General Electric Company, Re-Entry Systems Department (Figure 1, page 5).

As in any general systems analysis format, some of the elements will be indeterminant on the basis of available information. In the analysis of "constraints" to the various options, two important facts should be kept in mind. First, there will be a common group of constraints applicable to most options. These constraints will be listed at the end of this section. Pertinent general constraints will be listed by number in Column II (labelled constraints) on the flow sheets for each option. Secondly, constraints should be considered in two categories:

1. Absolute - by definition, an absolute constraint offers no alternatives; in effect, it totally blocks an objective or element of an objective (e.g., no funds);

# FLOW DIAGRAM FOR AN ANALYSIS OF THE OPTIONS



2. Relative - these constraints impose a varying degree of modification on the objective, proportional to the power of the constraint (e.g., 20% of the funds necessary to reach the objective).

Using this format, we will examine four options relating to the detection and treatment of:

- A. Thyroid and other radiation-related diseases in the exposed and control populations.
- B. All of A plus other patients already taken into the study with non-radiation related diseases (e.g., diabetes). This would include exposed and control group patients only.
- C. All of A and B plus all low level radiation exposed patients who have gone through full screening, irrespective of findings of disease, (e.g., the Bikini group).
- D. All of A, B, and C plus full screening of all inhabitants living on, or scheduled to be repatriated to, the Marshall Islands contaminated by atomic fallout; i.e., background radiation higher than median for all Micronesian islands.

FORMER  
RESIDENTS  
DO WE KNOW  
THIS NUMBER?  
HOW MANY  
ISLANDS  
QUALIFY  
2

With these four options in mind, we must first consider the common constraints impinging on the subheadings listed under Column II of the flow sheet (see Figure I). The unique constraints for each option will be listed as appropriate. The common constraints are:

1. Under current operating policies, DOE responsibilities do not include health care for non-irradiation related pathologic conditions.
2. The definition of "radiation-related" pathologic conditions is not clear. There is uncertainty among radiation experts as to

??  
agreement

the biologic effects of long-term "low-level" radiation. The status of acute and long-term effects of higher levels of radiation offers a greater consensus by the experts. In light of the possible change in ICRP maximum permissible dose for the individual, the size of the study group may change in the future.

3. The dosimetry of the islands involved in the March 1, 1954 accident is uncertain. It has been restudied and revised repeatedly as new technology and new data become available. Under the circumstances, only population dosimetry is possible. It would appear from the pathologic results, at least to the thyroids of some of the children of Rongelap, that the individual variations might be considerably higher than was previously estimated (private communication with J. E. Rall, M.D., Director of the Institute of Metabolic and Allied Diseases, National Institutes of Health).
4. Irrespective of the calculated doses to the exposed population, the development of radiation-related disease for which the DOE/BNL/DOI has accepted moral and fiscal responsibility has fixed in the minds of the Marshallese the fact that they and their land have been "poisoned" (synonymous with the Marshallese word for radiation). This intellectual, psychological, and emotional set is deep-rooted and probably cannot be erased. NOT  
CORRECT
5. The Marshallese consider themselves a "unique" subpopulation of Micronesia. Their documented "injury" by the U.S., supported by anti-nuclear world opinion, gives them great political WHY IN  
QUOTES  
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and economic leverage. Their recent movement for "free association" will probably not progress to independence, without firm guarantees, in writing, by the United States, that we will continue to compensate the people for injury and damage to their land. Their current concept includes the descendants of those people who have been identified as "injured" through property and/or physical loss.

6. Conversely, the U.S. would like to resolve these claims equitably and to place some reasonable time limit on U.S. liability.
7. The current Trust Territory health care delivery "system" is totally inadequate to serve as the primary care referral base for the BNL team. The reasons for this include:
  - a) very poor administration (fiscal, personnel, planning, etc.);
  - b) poor liaison with their source of funds, i.e., Trust Territory;
  - c) under-trained professionals;
  - d) heavy patient load (high incidence of a wide spectrum of diseases).
  - e) very poor facilities and upkeep.
8. The current "power base" in the Marshall Islands lies in the hereditary leaders and their appointed followers. They have assimilated themselves into the modern (free association) government and exert considerable influence over the territory. They have vested interest in protecting their own wealth and positions and the people have little voice in the actual process of "self-determination". These leaders are the people with whom we must deal to resolve our problems, but we must understand their orientation and goals. One of these followers recently

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advised his constituents to refuse U.S. compensation payments because he interpreted the payments to be a final settlement for all future claims. We feel the leaders realize the possibility of the potential closing or significant reduction in the government investment in Kwajalein, which is their major financial base. Therefore, they will probably demand continued reparations for their land and people.

9. Due to the wide dispersion of the islands (atolls) and people, transportation for the medical team, as well as for the economy, becomes of primary importance. Little is being done to solve this problem.
10. Communications among the widely-scattered islands is non-existent or poor at best. This results in a fractionation of the people, poor flow of information, reliance on rumor, and little or no health care in emergency situations. The solutions to these problems are technologically very simple and relatively inexpensive. Yet somehow they have not been implemented.
11. High volume screening of patients for specific data has become a highly-specialized area. Improvements can be made in screening facilities and methodologies, and these are outlined.
12. The recent repatriation of the people of Bikini, who were noted to be accumulating an increased body burden of <sup>137</sup>Cesium,

BY  
WHOSE  
STANDARD

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has compromised, in the eyes of the Marshallese, the safety of living on "contaminated" islands. They ignore or reject the concept of "relative risk" based upon carefully-calculated background and ecologic measurements of radiation. The same reasoning will probably apply to the people on Eniwetok and Ujelang.

WHAT  
SAME  
REASONING?

13. Personnel ceilings, currently in effect at BNL, prohibit any significant expansion of the program, e.g., the addition of the people of Bikini and Eniwetok (please see Option C - IV Analysis-How - p. 13).

These constraints are put into context and dissected, in detail, in the following four flow sheets where the significance of their impact on the objectives can be related to the various approaches open to us. The flow sheets are detachable so that they can be placed in vertical sequence for comparison of each facet under each option.

#### VI. Trade-off or Synthesis

We realize that options A and B would in fact, represent a reduction in the level of health care delivery currently available. A review of the most recent "189" for FY'79 and '80 reveals that in February 1977, DOE agreed "to assist the TT in an expanded health care program for the people living at Rongelap and Utirik. This included complete medical and laboratory examinations of ...all Marshallese living on these atolls." The problems inherent in that agreement were the inability of the TT to follow-up on the diseases discovered in this expanded screening. The BNL field team has limited resources to adequately diagnose and treat primary medical problems. As a result of intensified screening, a large number of "abnormal" findings have been identified.

Not  
done  
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17  
11/2/78

OPTION A  
1. detection and treatment of radiation related pathology in exposed  
and control populations  
\*Note: Numbers under constraints refer  
to common constraints, text p. 74

## 1. Establish the ideal objectives

### 1. Screening:

What pathologic findings are sought?

(A) Thyroid + Hypofunction and/or

hyperplasia - adenoma or carcinoma

(B) Breast CA (C) Skin CA

(D) Hematologic-leukemia, myelo-

fibrosis, aplastic anemia, (E)

GI tract CA (F) Genetic abnor-

malities (sample size too small

to establish a cause + effect

relationship to genetic abnor-

malities) (per Dr. J. Neel).

### 2. Treatment:

Short-term whatever treatment

indicated to stabilize the

patient until he can be safely

transferred to a designated

tertiary care center for

definitive therapy.

Long-term therapy directed

towards the pathologic con-

dition(s) found at screening

or by tertiary care.

### 3. Follow up:

Short-term periodic re-

evaluation of any detected

abnormalities to determine

their status, e.g., progression

vs remission.

Long-term: fixed protocol to

follow tertiary/post operative

cases for the rest of their

lives.

## 11. Constraints

### Present levels of care

Screening: (1) (7) (9) (10) (11) \*

Treatment: (4) - BNL currently treats

radiation induced problems at BNL and

Cleveland with good results.

Our resident MD can easily follow up the

treated cases but not general primary care.

### Existing Policy

(1) (4) (5) (6) (7) (8) (9) (10) \*

A common

point of contact does not exist for all of

the agencies effecting or effected by the

BNL medical program.

### Existing needs and demands

(4) (5) (6) (7) (8) (9) (10) (11) \*

No unique

constraints for Option A.

### Projected needs and demands

(2) (3) (4) (5) (6) (7) (8) (9) (10) (11) \*

Option

A offers the minimum needs and demands but

will not meet the Marshallese expectations.

### Planning at other levels

(1) (2) (3) (5) (6) (7) (8) \*

The lack of coor-

dination/liaison among the many laboratories

and governmental agencies involved in the

care of the Marshallese has resulted in con-

flicting information from some concerned U.S.

officials. The resulting confusion has placed

the U.S. in a vulnerable position - ? credibility

Existing Facilities

(7) (8) (9) (10) (11) \*

The lack of a viable pri-

mary referral system is almost an absolute

constraint.

Final  
The costs of litigation brought by the Marshallese for compensation could result in  
(1) (5) (6) (7) (8) \* - option A will require the lowest operating budget, initially. However,  
significant increase in U.S. payments.

Impact - (1) (3) (4) (5) (7) (11) \* - Option A offers lowest requirements. However, a cubsack  
in the level of care provided will provoke lack of cooperation by the Marshallese resulting  
in poor cooperation, compliance + wasted time, poor data.  
Timing - (2) (3) (4) (7) \* - Marshallese claim injury due to long-term exposure to "low level"  
radiation. Recent U.S. "low level" studies and fear of long-term effects has strengthened  
Marshallese position. Bikini episode - media.

Demographic Population Characteristics (4) (7) (8) (9) (10) \* - The culture prohibits direct  
expression of hostility toward another. A mediator must be used. U.S. efforts to clarify  
circumstances unsuccessful to date.

## 11. Translation

### Restatement of refined

objectives in consideration

of restraints.

The relative constraints would

not materially change the basic

objectives of Option A. An addi-

tional objective has been generated

by the identification of a lack of

coordination among the various

agencies and labs involved in the

total care of the Marshallese

An additional objective would be

to establish a single contact point

in DOE to coordinate all these pro-

grams and to establish close liaison

with DOE & DOI. In addition, since

the logistics, e.g., transportation

is a common problem to all users,

there should be at least one

annual users meeting with additional

meetings as necessary.

## IV. Analysis

### Develop possible approaches to

attaining the objectives, with

each approach being stated in

terms of:

What: Screening(primary de-

tection). Treatment- short-term,

Follow-up, short & long-term,

Single contact point for effi-

cient coordination of above.

Who: BNL medical team has 25

years of experience. Option A

for screening, treatment and

follow-up. DOE best suited to

identify single contact point.

Where: Screening of exposed

and control populations where-

ever we can locate them.

When: Timing should be based

upon the best available know-

ledge regarding the time of ter-

val for the detection of radiat-

ion abnormalities.

How: The BNL medical team is

currently doing considerable

more than studying radiation

related pathology. A well-

planned, high intensity edu-

cational program would be

necessary to explain why the

medical program was being

reduced at this time. The

movement to "free a socia-

tion" will probably promote the

already inadequate health

care funding by the Trust

Territory.

Timing  
The timing of the BNL field surveys  
is of great importance for the  
following reasons: 1) Long lead time  
must be included to insure proper  
notification of the study group -  
(especially on the outer islands - we  
must always keep in mind the poor com-  
munications); 2) Long lead time and a  
fixed schedule will do much to counter  
the charges that BNL has planned its  
trips to the outer islands to coincide  
with the absence of many of the leaders;  
3) Evenly spaced visits, about 2 1/2 months  
apart will assist the BNL field staff in  
the follow-up of the pathologic condition.  
1. a relatively fixed time base line

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III. Translation  
restatement of refined  
objectives in consideration  
of restraints.

The relative constraints would  
not materially change the basic  
objectives of Option A. An addi-  
tional objective has been generated  
by the identification of a lack of  
coordination among the various  
agencies and labs involved in the  
total care of the Marshallese

An additional objective would be  
to establish a single contact point  
in DOE to coordinate all these pro-  
grams and to establish close liaison  
with DOE & DOL. In addition, since  
the logistics, e.g., transportation  
is a common problem to all users,  
there should be at least one  
annual users meeting with additional  
meetings as necessary.

IV. Analysis  
Develop possible approaches to  
attaining the objectives, with  
each approach being stated in  
terms of:  
What: Screening(primary de-  
tection). Treatment- short & long-term.  
Follow-up, short & long-term.  
Single contact point for effi-  
cient coordination of above.

Who: BNL medical team has 25  
years of experience. Option A  
for screening, treatment and  
follow-up. DOE best suited to  
identify single contact point.  
Where: Screening of exposed  
and control populations where-  
ever we can locate them.  
When: Timing should be based  
upon the best available infor-  
mation regarding the time inter-  
val for the detection of radiation  
abnormalities.

How: The BNL medical team is  
currently doing considerable  
more than studying radiation  
related pathology. A well-  
planned, high intensity edu-  
cational program would be  
necessary to explain why the  
medical program was being  
reduced at this time. The  
movement to "free a social-  
tion" will probably involve  
the already inadequate health  
care funding by the Trust  
Territory.

V. Selection Criteria  
Set forth the criteria for the selection of an approach:  
Performance or results  
A detailed research protocol will be developed to specify the  
medical criteria and algorithms for the detection of radiation  
related pathologic conditions (e.g., disease specific items in  
the history, physical exam and laboratory profile to detect  
the earliest deviation from "normal function" + TSH (to  
document thyroid hypofunction). Each identified pathologic  
condition (listed under objectives) will be screened by the  
appropriate methodologies. Treatment and follow-up will be  
assured by appropriate algorithms and check lists.

Total cost(s)  
The total cost will be very close to our 1.8 expenditures.  
The reduction in the patient population will be offset by  
the cost of the educational program to explain the reason for  
our cut-back in services and by inflation.  
Flexibility  
This option offers us little flexibility. The pathologic  
conditions related to radiation exposure in the range deter-  
mined for the Marshall Islands is rather limited. Our pro-  
gram under this option would be constrained to this limited  
area.

Avoidance of untoward consequences  
With strictly limited goals the probability of obtaining  
valid data and early detection of disease is enhanced by  
concentration of funds on limited objectives - i.e., minimum  
dilution of effort. However, the public outcry against the  
reduction in the program could have serious political/sociologic  
consequences.

Risk  
The risks to DOE/BNL are: The public reaction to reduced  
medical care. We are unable to quantify the risks to the  
program offered by this option but they would probably include:  
lack of patient cooperation (resulting in 7 days), vigorous  
public protest (locally and internationally) and a vigorous  
program for DOE/BNL to, at least, return to the previous level  
of care. Risks for the Marshallese are: 1) Failure to detect  
other than radiation related diseases - with increased mor-  
tality and mortality among the exposed & control groups. 2)  
Possible alienation of the Marshallese by DOE/BNL resulting  
in a breakdown in vital communication.

Cost/effectiveness - No data format now exists to compute cost/  
effectiveness or cost/benefit. The diffuse funding mechanisms make  
it very difficult for the principal investigator to obtain an  
accurate current accounting of monies expended on the medical pro-  
gram. If such data were available and all screening, treatment and fol-  
low-up costs clearly defined, some rough estimation of cost/patient  
could be derived.

OPTION B  
The selection and treatment of radiation-related diseases plus the care and follow-up of patients in the Exposed and Control Groups found to have non-radiation related diseases

## Establish the ideal objectives.

### II Constraints

- A. Screening for radiation-related pathologic conditions as in Option A - plus additional screening for age and sex correlated high risk diseases.
- B. Treatment as in Option A for radiation-related diseases. For all other diseases change "tertiary" care center to primary or secondary care center, as available.
- C. Follow-up (as in Option A) - Change tertiary care to primary or secondary care, as available.

### Present levels of care

Screening: as in Option A - plus, need to develop "risk tables" (age and sex specific) to expand the screening data base. The relative improvement in recent health "statistics" should be of some assistance. Treatment: (1) (7) (9) (10) (11) plus increased logistic requirements of added care. Follow-up: As in Option A - plus increased logistic and manpower required for care.

### Existing Policy

As in Option A - plus current operating procedures already includes this added group and others.

### Existing needs and demands

As in Option A - The need for better primary care is evident to many Marshallese. They are currently and have historically, demanded better care.

### Projected needs and demands

As in Option A - plus an ever increasing base population - crude growth rate 3% - better primary medical care will probably reduce mortality resulting in increasing population. Many Marshallese are asking for birth control education.

### Planning at other levels

As in Option A - Plus significant decrease in already meager T.T. support of medical care due to vote for "free association".

### Existing Facilities

As in Option A - plus the increased load of further patient care would strain the existing facilities resulting in severely diminishing returns for each health dollar (below minimum "Critical Mass")

Financial: (1) (5) (6) (7) (8) The added screening costs will be a small increment in the existing screening program. The added primary and secondary care and follow-up - both short/long term may be a significant amount (dependent upon the diseases selected and their prevalence). (See facilities for

Manpower: (13) As in Option A - but better cooperation will hopefully improve compilar (and quality of data). The increased screening requirements can be handled by better utilization of manpower, adding one Physician Asst. or nurse practitioner.

Timing: As in Option A - However, increased coverage should raise credibility of DOE/1. This option is still below current operating procedures.

Demographic Population Characteristics: As in Option A - but with a radiation induced hostility + increased cooperation. Population under care, still being, current operating policies. 5052226

### III. Translation

Restatement of refined objectives in consideration of restraints.

As in Option A - The increased patient care demanded by Option B will require a slight increase in manpower and logistics (funding). Since the increase is directly related to primary patient care and is, therefore, not DOE's responsibility, perhaps some inter-agency agreement with DOI could be reached to provide this supplement. In addition, if, under the "free association" agreement the DOD-Kajalein taxes are to paid directly to the Marshall Islands, some fixed portion might be diverted to primary medical care under a DOD/Kaj-Marshal Island Government agreement.

### IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: As in Option A - plus selected "risk hazard appraisal" screening, care and follow-up

Who: As in Option A - BNL is currently exceeding Option B in its active commitment.

Where: Screening, care and follow-up of exposed and control groups wherever we can locate them.

When: As in Option A - plus regular intermittent visits (every 24 months) for follow-up of non-radiation related problems (already being done).

How: We would, actually, need to cut back on our present commitments to comply with Option B, e.g., we have already put almost all of the people formerly on Bikini through the entire screening procedure.

### V. Select

Set forth the criteria

Performance or results  
As in Option A to be expanded to not currently assessed will be used to find findings would be diseases (age and atherosclerosis) young and old mal

### Total Cost

As in Option A (explaining the cost discussed in the that this option

### Flexibility

There is increased stationed at Eley in fact, it would

Avoidance of uncertainty  
The added flexibility shaky credibility the critical point credibility gap a frequently and b) as soon as it is

### Risk

The risks to DOE effort is below (publicity, cooperation) The risks to the disease will be

### Cost/Effectiveness

As in Option A

### Timing

As in Option A existing schedule

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### III. Translation

Restatement of refined objectives in consideration of restraints.

As in Option A - The increased patient care demanded by Option B will require a slight increase in manpower and logistics (funding).

Since the increase is directly related to primary patient care and is, therefore, not DOE's responsibility, perhaps some inter-agency agreement with DOI could be reached to provide this supplement. In addition, if, under the "free association" agreement the DOD-Kwajalein taxes are to paid directly to the Marshall Islands, some fixed portion might be diverted to primary medical care under a DOD/Kwaj-Marshal Island Government agreement.

How: We would, actually, need to cut back on our present commitments to comply with Option B, e.g., we have already put almost all of the people formerly on Bikini through the entire screening procedure.

As in Option A - plus selected "risk hazard appraisal" screening, care and follow-up.

What: As in Option A - plus selected "risk hazard appraisal" screening, care and follow-up.

Who: As in Option A - BNL is currently exceeding Option B in its active commitment.

Where: Screening, care and follow-up of exposed and control groups wherever we can locate them.

When: As in Option A - plus regular intermittent visits (every 2 1/2 months) for follow-up of non-radiation related problems (already being done).

Flexibility: There is increased flexibility with this option. We feel the BNL team stationed at Ebeye could handle this additional load without problems - in fact, it would enrich their practice and provide some welcome variety.

Avoidance of untoward consequences The added flexibility and commitment of the DOE/BNL team should enhance our shaky credibility and generate true gratitude among some of the Marshallese. The critical point is never to promise more than you can deliver. The credibility gap may be partially patched by saying "I don't know" more frequently and by forwarding all pertinent data on to interested Marshallese as soon as it is available.

Risk The risks to DOE/BNL are less than with Option A - However, this level of effort is below the current program and will cause some adverse reaction (publicity, cooperation, etc.). The risks to the Marshallese are that a great deal of potentially treatable disease will be excluded from our attention by this option.

Cost/Effectiveness As in Option A

Timing As in Option A - The increased population would not appreciably change our existing schedule.

### V. Selection Criteria

Set forth the criteria for the selection of an approach:

Performance or results As in Option A - However, the section on radiation-related diseases will need to be expanded to include those age and sex specific general medical problems not currently associated with radiation. The methodology of Robbins and Hall will be used to determine what specific historical, physical, and laboratory findings would be most sensitive and specific to detect the most prevalent diseases (age and sex-determined, e.g., we will not look for coronary atherosclerosis in young females, evidence for alcoholism will be sought in young and old males, etc.).

Total Cost As in Option A - but we can cancel out the specific education program (explaining the cut in services). The various cost trade-offs have been discussed in the previous sections of this option. We must keep in mind that this option is still below our present commitment.

Flexibility There is increased flexibility with this option. We feel the BNL team stationed at Ebeye could handle this additional load without problems - in fact, it would enrich their practice and provide some welcome variety.

Avoidance of untoward consequences The added flexibility and commitment of the DOE/BNL team should enhance our shaky credibility and generate true gratitude among some of the Marshallese. The critical point is never to promise more than you can deliver. The credibility gap may be partially patched by saying "I don't know" more frequently and by forwarding all pertinent data on to interested Marshallese as soon as it is available.

Risk The risks to DOE/BNL are less than with Option A - However, this level of effort is below the current program and will cause some adverse reaction (publicity, cooperation, etc.). The risks to the Marshallese are that a great deal of potentially treatable disease will be excluded from our attention by this option.

Cost/Effectiveness As in Option A

Timing As in Option A - The increased population would not appreciably change our existing schedule.

All radiation related diseases in the exposed and control groups on Bonga and Utirik plus all low level radiation exposed patients who have already gone through full : reming - irrespective of findings of disease

## I. Establish the broad objectives

As in Options A and B but adding all patients, exposed to low level radiation, who have already gone through the BNL screening procedures. This represents the current level of operation. In the future, the screening will be modified as detailed for the "directed data base - risk hazard appraisal" approach of Robbins and Hall.

## II. Constraints

Present levels of care As in Options A and B.

Existing Policy As in Options A and B.

This option reflects existing de facto field policy.

Existing needs and demands As in Option A and B. Adding a

portion of the Bikini population will probably not fulfill the Marshallese demands or needs.

Projected needs and demands As in Option A and B. It seems

probable that we will be unable to separate, for medical purposes, the Bikini people who returned to

Bikini from the remainder on Kili. The Eniwetok people will probably

also demand equal treatment.

Planning at other levels As in Option A and B. Powerful

U.S. congressional groups (Hearings Committee - on appropriations, etc.) are interested in and in-

vestigating the well-being of the Marshallese.

Existing facilities As in Option A and B. Ade-

quate screening and treatment support facility - would in the long run increase efficiency and reduce

cost, patient.

Financial As in option A and B. The signifi-

cant variable will be the (?) addition of the people of Bikini and Eniwetok.

Manpower As in Option A and B. Again the addition of Bikini and

Eniwetok would more than double the outpatient load. However, the staff could probably handle the increased load with the addition of a physician assistant and a nurse practitioner.

Timing As in Option A and B. No further constraints.

Demographic Population Characteristics As in Option A and B. Plus all patients (exposed to low level radiation) on Bonga and Utirik. Adding Bikini (450) + Eniwetok (450).

## III. Translations

Restatement of refined objectives in consideration of restraints.

As in Options A and B - 5 once this is our present level of

operation with existing funds - no significant

translation of objectives is needed.

## IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: As in Options A and B.

Who: As in Options A and B. -

How: For discussion of costs.

Flexibility: As in Options A and B - Increasing

larger responsibility for care and (and manpower) - permits better sche-

Avoidance of untoward consequences As in Options A and B - plus added comprehensive care.

Risk: As in Options A and B. - With incre-

patient care the possibility of sub-

performance may increase - ? Over-

can be offset by adequate planning support - Expanded operations with-

should not be attempted.

Cost/Effectiveness As in Options A and B.

Timing As in Options A and B. This is the

As in Options A and B. This is the

to enlarge the program and to make a

change the image of the study.

function as advisors, but

alleviate some of the

anxiety of the new study

group that would arise from

the "radiation" oriented

BNL group. We would suggest

the University of Hawaii as

the most suitable and in-

creased party. Funding for

this increase in primary care

might be obtained by pass-

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III. Translations

Restatement of refined objectives in consideration of restraints.

As in Options A and B - Since this is our present level of operation with existing funds - no significant translation of objectives is needed.

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: As in Options A and B.

Who: As in Options A and B.

How: For discussion of costs.

Flexibility: As in Options A and B - Increasing flexibility due to larger responsibility for care and better support (logistic and manpower) - permits better scheduling.

Avoidance of untoward consequences: As in Options A and B - plus added credit for more comprehensive care.

Risk: As in Options A and B - With increasing volume of patient care the possibility of suboptimal or poor performance may increase - ? Over treatment - this can be offset by adequate planning and logistic support - Expanded operations with these elements should not be attempted.

Cost/Effectiveness: As in Options A and B.

Timing: As in Options A and B. This is the optimum time, in light of the political and sociologic situation in the Marshalls to enlarge the program and to make a positive effort to change the image of the study.

Eniwetok group from BNL - Identity of the Bikini-Eniwetok group from BNL - We could retain administrative control and function as advisors, but a subcontractor might alleviate some of the anxiety if the new study group that would arise from the "radiation" oriented BNL group. We would suggest the University of Hawaii as the most suitable and interested party. Funding for this increase in primary care might be obtained by passing through funding from DOI.

V. Selection Criteria

Set forth the criteria for the selection of an approach:

Performance or results: As in Options A and B.

Total cost: As in Options A and B. See column IV.

How: For discussion of costs.

Flexibility: As in Options A and B - Increasing flexibility due to larger responsibility for care and better support (logistic and manpower) - permits better scheduling.

Avoidance of untoward consequences: As in Options A and B - plus added credit for more comprehensive care.

Risk: As in Options A and B - With increasing volume of patient care the possibility of suboptimal or poor performance may increase - ? Over treatment - this can be offset by adequate planning and logistic support - Expanded operations with these elements should not be attempted.

Cost/Effectiveness: As in Options A and B.

Timing: As in Options A and B. This is the optimum time, in light of the political and sociologic situation in the Marshalls to enlarge the program and to make a positive effort to change the image of the study.

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# OPTION D

All radiation related diseases in the exposed and control populations plus full screening of all inhabitants now living (or scheduled to be repatriated to) Marshall Islands contaminated by atomic fallout

## I. Establish the broad objectives

As in Options A, B and C but with added emphasis on early detection and treatment of all significant diseases. This option offers unequivocal evidence of the true concern of the U.S. for the comprehensive health care of the peoples of the islands contaminated by the testing program.

In addition, such a program would allow us to develop a much more significant "health profile" of the Marshall Islands to assist in the determination of potential radiation related pathological conditions.

Existing needs and demands  
This option most closely meets the needs and demands of the Marshallese people and their leaders.  
Existing Policy  
As in Options A, B and C - In addition, in light of the recent (Oct. 12, 1978) DOE/DOJ meeting on the status of the peoples of Eniwetok and Bikini, it appears that this option is the one favored by the Under Secretary of the Interior, Mr. Joseph.

## II. Constraints

Present levels of care  
As in Options A, B and C - This option exceeds the mandates of our present program and would be impossible without an appreciable increase in funding.

Projected needs and demands  
Since this option provides adequate health care for all currently and potentially involved Marshallese, it should meet all projected needs and demands  
Planning at other levels  
As in Options A, B and C  
Existing facilities  
As in Options A, B and C - A major expansion of existing facilities would be necessary to support a medical program more than twice the present effort.  
Financial  
A cost study would need to be instituted as soon as possible to determine the current and future costs of such a program (please see section V Selection Criteria) - under "Total Costs".

Manpower (13)  
As in Options A, B and C. - Please see Section IV Analysis of "How" for manpower requirements.  
Timing  
The time is now optimum for DOE - Light of DOI and Marshallese statements of needs.

DOE in the Position Characteristics  
As in Options A, B and C - The program covered will be much more than DOE - Light of DOI and Marshallese statements of needs.

## III. Translation

Restatement of refined objectives in consideration of restraints.

As in Options A, B and C, the restatement of objectives will be dependent upon:

1. The definitions of the role (moral/fiscal) of the administrators of DOI and DOE to carry through on the statements of principal made at the Oct. 12, 1978 - DOI/DOE/DOJ meeting in Washington, D.C. concerning the status of the peoples of Bikini and Eniwetok.
2. If full health care responsibility is assumed - Option D
3. If limited health care responsibility is the choice - some compromise between Options C and D is indicated.

## IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering peoples of Rongelap - Utirik) and (B) the "low level" study group - under contract - with support by adequate-10-20 care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, physicians assistants and nurse practitioners.

## Risk

Least risk of all options then not honored.

Cost/effectiveness

As in Options A, B and

## Timing

This is the optimum timing reasons: A) The movement the health care delivery in this period of general health care delivery of Bikini and Eniwetok, to their very legitimate

## V. Selection Criteria

Set forth the criteria to performance or results

Research based upon a system will provide optimum of these only about 2,000 population of the Marshall Islands. The remaining Option D. The remaining the general improvement primary centers, - but the medical staff - work medical officers and the

Total cost

Really impossible to d However, based upon our to Option D should cost

Flexibility

This option gives us t examinations in the field medical and transportation

Avoidance of unward co This option offers the ment to the people. Thi image of U.S. in all of trained physicians at Majuro and Ebeye - supported by para-medical personnel, physicians assistants and nurse practitioners.

Cost/effectiveness

## Timing

This is the optimum timing reasons: A) The movement the health care delivery in this period of general health care delivery of Bikini and Eniwetok, to their very legitimate

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## III. Translation

Restatement of refined objectives in consideration of restraints.

As in Options A, B and C,

the restatement of objectives will be dependent upon:

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering people of Rongelap-Utrik) and (B) the "low level" study group - under contract - both supported by adequate-10-20 care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, physician assistants and nurse practitioners.

major expansion necessary to have twice the

adequate response to the needs of the people and

addition, is of the role (moral/fiscal) of the administrators of DOI and DOE to carry through on the statements of principal made at the Oct. 12, 1978 - DOI/DOE/DOD meeting in Washington, D.C. concerning the status of the peoples of Bikini and Eniwetok. If full health care responsibility is assumed - Option D needs no restatement.

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Restatement of refined objectives in consideration of restraints.

As in Options A, B and C,

the restatement of objectives will be dependent upon:

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering people of Rongelap-Utrik) and (B) the "low level" study group - under contract - both supported by adequate-10-20 care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, physician assistants and nurse practitioners.

## IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering people of Rongelap-Utrik) and (B) the "low level" study group - under contract - both supported by adequate-10-20 care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, physician assistants and nurse practitioners.

## V. Selection Criteria

Set forth the criteria for the selection of an approach:

Performance or results

Research based upon a sound primary - secondary care delivery system will provide optimum care for each patient. The total population of the Marshall Islands is about 22,000 people - of these only about 2,000 would be completely covered by Option D. The remaining 20,000 would benefit greatly by the general improvement in the quality of care at the primary centers, - but that would be a secondary goal of the medical staff - working with the existing Marshallese medical officers and their staffs.

Total cost Really impossible to develop a reasonably accurate figure. However, based upon our present operating expenses (Option C) with a cumulative budget of about 1 million the expansion to Option D should cost about 1 to 1½ million extra.

Flexibility This option gives us the greatest flexibility in scheduling examinations in the field, due to the increased on-site medical and transportation resources.

Avoidance of untoward consequences This option offers the best proof of a sincere-U.S. commitment to the people. This should help greatly in improving the image of U.S. in all of the media - U.S. as well as international. In addition, with the new "free association", the Marshallese might decide to fill the primary medical care vacuum with Japanese physicians (with the good possibility that left wing - anti-nuclear MD's might become entrenched in the Marshalls).

Risk Least risk of all options - unless commitment was made and then not honored.

Cost/effectiveness As in Options A, B and C.

Timing This is the optimum time for implementing Option D - for two reasons: A) The movement toward "free association" has placed the Marshall Islands in a state of transition. The revisions in the health care delivery systems could move along most smoothly in this period of general and economic transition. B) The people of Bikini and Eniwetok are demanding quick and decisive answers to their very legitimate requests.

These demand further study and resolution if we are to meet the basic tenets of screening: Do NOT screen unless:

1. You are prepared to follow-up and resolve false positive and false negative findings.
2. The screening process will result in some benefit for the patient.

From a moral and medicolegal standpoint, we should insure adequate follow-up and treatment of all treatable conditions. To identify disease, inform the patient of the disease and then fail to treat it, would run the risk of a serious loss of credibility for the medical team; and more importantly, a disservice to the patient. For example, if a patient is told he is hypertensive (e.g., diastolic over 105 mmHg), and is not treated, he can assume that:

1. the findings are of little importance because..."the doctors did nothing about it...";
2. the doctors don't care enough about the patients to try to treat the condition.

Either result is undesirable.

These problems in the "philosophy" of screening are not minor. They should not be ignored in planning this program. A close examination of the actual field conditions reveals that the unavailability of adequate treatment and follow-up is the critical preliminary determinant of exactly what should be done in planning the details of medical and biochemical screening for primary care. Screening for research operates under different constraints, usually protected by a committee to inform and protect the research subject (A Human Studies Review Committee). Failure to comply with either the research or primary care requisites

of screening is to invite patient dissatisfaction, litigation, loss of credibility and poor medical practice.

We have emphasized the problems inherent in "expanded" screening because the research goals of the radiation related diseases are clearly defined in the "189", but the "expanded health care program" is relatively undefined. We have attempted to define the basic "189" in Option A and the spectrum of "expanded health care programs" in options B through D.

The synthesis we are attempting to achieve is the full mandate of Option A, plus as much of Option D as is feasible under present jurisdictional and funding constraints. DOE clearly has responsibility for Options A and B and the Trust Territories (under DOI) the remainder of primary and secondary care under Options C and D. However, with the new movement to "free association" the responsibility will shift to the administration and people of the Marshall Islands. We would suggest some initial interdepartmental funding to support whichever option DOE/DOI desires until the status of the "free association" is clarified. After a responsible governing body is identified in the Marshalls a new "sharing" of primary and secondary health costs might be negotiated with the Marshalls, that would direct an adequate percentage of their budget into health care. We feel the medical administrative expertise does not currently exist in the Marshalls to implement and manage this new system and would strongly urge the interested parties to obtain the best available health care system analyst to develop realistic cost/effective short and long term plans for adequate health care with existing and expected resources.

This is the optimum time to perform this type of study and planning and the outcome will greatly influence the scope of the BNL medical effort. Serious consideration should be directed toward the utilization of existing expertise in developing health care systems for the South Pacific. The University of

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Hawaii has developed well-recognized and highly-effective programs to deal with many of the basic problems confronted by the Marshall Islands. Those problems are basically a maze of anthropologic and sociologic characteristics determining the health status of the society and each individual. We feel a multidisciplinary approach to restructuring the health care system will be the most cost/effective method in the long run. The University of Hawaii has expressed an interest in discussing this concept with the BNL team. We feel a coordinated effort by BNL and the University of Hawaii, working with the existing Trust Territory medical program could achieve most of the goals of Option D. Such a program could be developed incrementally, under contract, as specific problems were identified.

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ADDENDUM I  
TO  
DOE  
POSITION PAPER ON THE  
BNL MARSHALL ISLAND PROGRAM  
(DATED DECEMBER 1st, 1978)

Dr. Wyzen of the DOE has asked for amplification of the role of the BNL resident physician under each of the options listed in the basic position paper.

Dr. Conard and I feel the role of the resident physician under Option A (the detection and treatment of radiation-related pathology in exposed and control populations) should be outlined as follows:

1. The resident physician's (RP) primary responsibility is to function as the on-site coordinator of the BNL program. He is responsible, in addition, for the supervision of the daily follow-up and treatment of the exposed and control groups in the basic research protocol for radiation-related diseases.

Additional responsibilities under Option B: (A-plus the care and follow-up of patients in the exposed and control groups found to have non-radiation related diseases, e.g., diabetes) would include:

1. As in A - plus the medical follow-up and treatment as indicated for those specific conditions found in ancillary studies as part of the BNL field surveys, e.g., diabetes.

Additional responsibilities under Option C: (A and B - plus medical care for all low-level radiation exposed patients who have already gone through full screening - irrespective of findings of disease, e.g., people living on Bikini - April 1978) would include:

1. As in A and B - plus screening, follow-up and treatment for the 137 people examined on Bikini (April 1978).

Finally, the additional responsibilities under Option D : (A,B and C plus full screening and follow-up) of all inhabitants now living on (or scheduled to be repatriated to) Marshall islands contaminated by atomic fall-out):

1. As in A, B and C - plus the medical care, i.e., screening, follow-up, treatment and primary preventive medicine of this enlarged study group (maximum about 2000 patients).

The term "medical care" in each of these options has been purposely left undefined. The spectrum of medical care could range from a very narrow interpretation of the research mandate related solely to the detection and treatment of pathologic conditions thought to be related, with a high probability, to radiation exposure to a widely expanded concept of "medical care" covering primary prevention, 1<sup>o</sup>-2<sup>o</sup> care and comprehensive health care - similar to the defined role of the family practice physician, as defined by the Academy of Family Practice.

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